

Dr. Babasaheb Ambedkar Open University
Term End Examination July – 2026

Course	: BCA	Date	: 08/07/2026
Subject Code	: BCAR/DCAR-203	Time	: 03.00pm to 05.15pm
Subject Name	: Digital Electronics and Computer Organisation	Duration	: 02.15 Hours
		Max. Marks	: 70

Section A

Answer the following (Attempt any three) (30)

1. Explain the Instruction Cycle of a Digital Computer. Discuss the Fetch, Decode and Execute phases with a neat diagram.
2. Discuss Binary Addition, Binary Subtraction using 2's Complement and Overflow with suitable examples.
3. Explain Combinational Logic Circuits.
4. Explain Sequential Logic Circuits. Discuss Registers, Shift Registers and their practical applications in digital systems.
5. Discuss Registers, Cache Memory, Main Memory and Secondary Memory with suitable diagrams.

Section B

Answer the following (Attempt any four) (20)

1. Explain the characteristics of Digital Computers.
2. Convert $(275)_{10}$ into Binary.
3. Explain BCD (8421) Code with one example.
4. Differentiate between SRAM and DRAM.
5. Write a short note on the Program Counter (PC).
6. Explain the purpose of the Control Unit (CU).

Section C

Part – A (Multiple Choice Questions) (10)

Q.1 During program execution, which CPU component determines the sequence in which instructions are processed?

- A) Arithmetic Logic Unit B) Control Unit
C) Cache Controller D) Memory Register

Q.2 Which binary representation is preferred in computers because it simplifies arithmetic operations involving negative numbers?

- A) Sign-Magnitude B) One's Complement
C) Two's Complement D) Gray Code

Q.3 A designer wants to transmit the value of one input line selected from several available inputs. Which combinational circuit should be used?

- A) Decoder B) Multiplexer
C) Encoder D) Comparator

Q.4 Which device is primarily responsible for temporarily storing binary information during processing?

- A) Register
C) Optical Disk
Q.5 Which memory type generally provides the fastest access time?
A) Magnetic Disk
C) Cache Memory
Q.6 Which register normally contains the address of the next instruction to be fetched?
A) Instruction Register
C) Program Counter
Q.7 Which flip-flop changes its output state whenever its input is HIGH during the triggering edge?
A) SR Flip-Flop
C) T Flip-Flop
Q.8 Which bus is used to transfer instructions and data between the CPU and memory?
A) Address Bus
C) Control Bus
Q.9 Which memory organization principle aims to provide high performance at a reasonable cost?
A) Uniform Memory Access
C) Virtual Addressing
Q.10 Which operation is performed immediately after an instruction is fetched from memory?
A) Execution
C) Storage
- B) Hard Disk
D) Plotter
B) Main Memory
D) Optical Memory
B) Memory Data Register
D) Status Register
B) D Flip-Flop
D) RS Latch
B) Data Bus
D) Expansion Bus
B) Memory Hierarchy
D) Paging
B) Decoding
D) Interrupt Processing

Part – B (State whether the following statements are true or false)

(10)

- 1 The Program Counter is updated after an instruction is fetched under normal program execution.
- 2 Every binary code used in digital systems is a weighted code.
- 3 A Multiplexer can be used as a data selector in digital circuits.
- 4 Cache Memory reduces the average memory access time of the processor.
- 5 Registers generally provide faster access than Main Memory.
- 6 The Control Unit directly performs multiplication and division operations.
- 7 Two's Complement representation simplifies subtraction in digital computers.
- 8 Shift Registers can perform serial-to-parallel data conversion.
- 9 A Decoder may generate multiple active outputs simultaneously for a valid binary input.
- 10 Memory hierarchy improves overall system performance by combining memories with different speeds and capacities.
